

## SYSTEMATIC REVISION OF *PARAPTILA* MEYRICK (TORTRICIDAE)

JOHN W. BROWN

10 East Sierra Way, Chula Vista, California 91911

**ABSTRACT.** *Paraptila* Meyrick is a neotropical tortricid genus distributed from central Mexico to northern South America. Three previously described species [i.e., *P. argocosma* Meyrick, *P. gamma* (Walsingham), and *P. cornucopis* (Walsingham)] and five new species (i.e., *P. pseudogamma*, *P. bloomfieldi*, *P. biserrata*, *P. symmetricana*, and *P. equadora*) are recognized. Descriptions, or redescrptions, and illustrations of the genitalia are presented for each species. *Paraptila hydrochoa* Meyrick is transferred to *Popayanita* Razowski (**new combination**). The synonymy of *Paraptila infusoria* Meyrick and *P. gamma* is proposed (**new synonymy**). The presence of a male foreleg hairpencil from the base of the femur appears to represent a synapomorphy supporting the tribal assignment of *Paraptila* to Euliini.

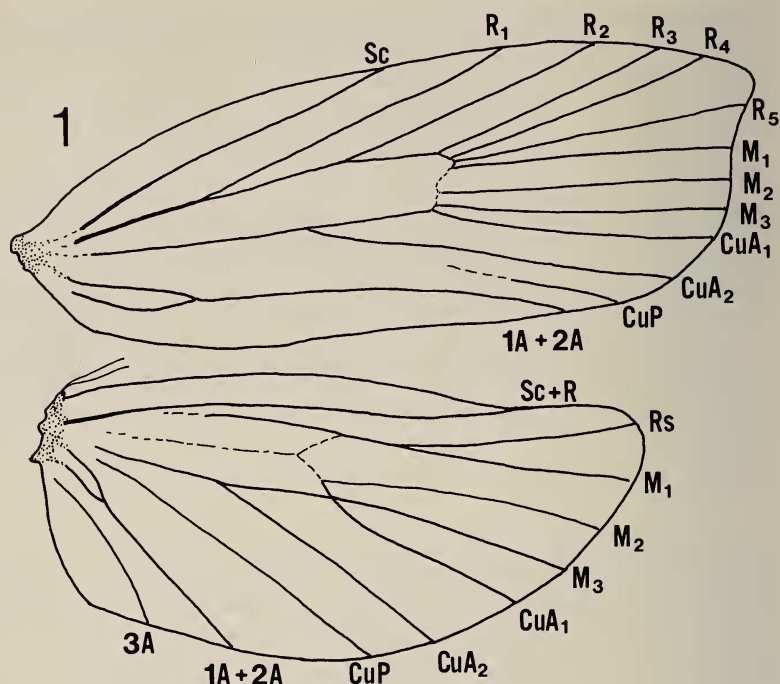
**Additional key words:** Euliini, hairpencil, neotropical, new species.

The genus *Paraptila* was described by Meyrick (1912) to accommodate the single species *P. argocosma*. Meyrick later described two additional species in the genus, *P. infusoria* (Meyrick 1926) and *P. hydrochoa* (Meyrick 1930). The latter is neither superficially nor morphologically similar to *P. argocosma* and *P. infusoria*, and is transferred to *Popayanita* Razowski (new combination), with which it shares faces and a similar configuration of the valva, uncus, and gnathos.

Two species described by Walsingham (1914), *Enarmonia cornucopis* and *Tortrix gamma*, are congeneric with *P. argocosma* and *P. infusoria*. The holotype male of "*T.*" *gamma* is apparently conspecific with *P. infusoria*, while the single paratype appears to be conspecific with "*E.*" *cornucopis*. Five previously undescribed species of *Paraptila* were discovered in the collections of the National Museum of Natural History, Washington, D.C. (USNM); Essig Museum of Entomology, University of California, Berkeley (UCB); San Diego Natural History Museum, San Diego, California (SDNHM); and British Museum (Natural History), London, England (BMNH).

In this paper I redescribe the genus *Paraptila* and all correctly associated, previously described species (i.e., *P. argocosma*, *P. gamma*, and *P. cornucopis*), propose the synonymy of *P. infusoria* and *P. gamma*, transfer *P. hydrochoa* to *Popayanita*, and describe five species as new: *P. pseudogamma*, *P. bloomfieldi*, *P. biserrata*, *P. symmetricana*, and *P. equadora*.

Dissection methodology followed Powell (1964). Terminology and homology of wing venation and genitalic structures follows Horak (1984); FW = forewing; HW = hindwing; DC = discal cell.

FIG. 1. Wing venation of *Paraptila argocosma*.

## PARAPTILA MEYRICK, 1912

*Paraptila* Meyrick (1912:677), Meyrick (1926:259), Clarke (1958:167), Razowski (1986:21), Powell (1986:374).

**Type species.** *Paraptila argocosma* Meyrick (1912), by monotypy.

**Head:** Antennal setae in male ca.  $1.25 \times$  flagellar segment width. Labial palpus slightly upturned, moderately broad; segment II expanded distally by scales to ca.  $1.8 \times$  its basal diameter, slightly curved; segment III ca.  $0.25$  as long as II. Maxillary palpus longer than pilifer. Frons scaling with overhanging crown tuft; smooth and sparse below mid level of eye. Ocelli well developed. Chaetosema present. Periorbital strip scaled. **Thorax:** With upraised scale tuft situated posteriorly. Male foreleg with hairpencil consisting of a fascicle of elongate setae arising from base of femur, extending to base of coxa; hairpencil absent in female. **Forewing:** Venation as in Fig. 1. Length  $2.5$ – $2.6 \times$  width; length of DC ca.  $0.55 \times$  FW length; width of DC ca.  $0.15$  its length;  $CuA_2$  originating ca.  $0.65$  along length of DC;  $R_1$  and  $R_5$  connate or very short-stalked;  $M_3$  and  $CuA_1$  separate; CuP present; chorda absent; M-stem absent. **Hindwing:** Venation as in Fig. 1. Sc+R and Rs separate; Rs and  $M_1$  stalked;  $M_3$  and  $CuA_1$  connate; CuP vestigial; M-stem absent. **Abdomen:** Dorsal pits absent. **Male genitalia:** Uncus extremely long, thin, drawn out to fine apex (except in *P. equadora*). Socii strongly arched basally, large, pendant, with dense, elongate scales, the largest of which originate from distinct sockets; usually divided longitudinally into scaled and naked portions. Gnathos arms narrow, smooth, from lateral margin of tegumen, joined distally into slender mesal process, usually with a minute hook distally. Transtilla usually constricted mesally; large spur-like projection(s) subbasally; shallow cone-like depression at base. Valva simple, long rectangular, rounded apically; sacculus a narrow ridge, usually attenuate within basal  $0.5$ . Aedeagus large, stout, with

broad, rounded phallobase; usually with single, large cornutus. **Female genitalia:** Papillae anales elongate, flattened, nearly parallel-sided. Apophyses posteriores broad, inflated, sack-like (except in *P. argocosma*); apophyses anteriores long, slightly broadened in basal 0.75. Sterigma irregularly rectangular, weakly sclerotized; usually with lateral band and patches of sclerotization near ostium. Ductus and corpus bursae not distinctly differentiated; ductus bursae usually with sclerotized region near ostium. Corpus bursae simple, without accessory bursa; spiculae variable from faint and indistinct to large and dense; signum absent. Ductus seminalis from near middle of corpus bursae.

**Distribution and biology.** *Paraptila* is distributed from Colima to Veracruz, Mexico, south to Bolivia. The early stages are unknown.

**Diagnosis.** *Paraptila* is characterized superficially by a reddish or purplish brown forewing featuring a distinctive silver-white, cornucopia-shaped patch bordering the costa. This forewing pattern is unlike any other genus in the Euliini. The most conspicuous synapomorphies for the genus include 1) narrow, nearly lateral, mesally joined arms of the gnathos, bearing a fine, hooked tip, 2) long, complex, strongly curved socii with a narrow longitudinal line of sclerotization, and 3) broad, inflated, sack-like apophyses posteriores (unmodified in the presumably most plesiomorphic species, *P. argocosma*). The presence of a male foreleg hairpencil remarkably consistent with that of other genera in the Euliini (Brown 1990) confirms the tribal assignment of *Paraptila* (Powell 1986). The genus is uniform in external facies, and genitalic preparations are required for accurate species determination.

Males of all species but *P. biserrata* have a single, large, basally attached cornutus. The absence of cornuti in bursae of dissected females ( $n = 15$ ) indicates that the structure is almost certainly non-deciduous, consistent with other genera in the Euliini, and in contrast to the condition found in Sparganothini and Atteriini.

On the basis of the unusual modification of the socii and the general configuration of the female genitalia, *Paraptila* appears to represent the sister group to *Terinebrica* Razowski.

### 1. *Paraptila argocosma* Meyrick

(Figs. 1, 8)

(Illustrated in Clarke 1958:166)

*Paraptila argocosma* Meyrick (1912:677), Clarke (1958:167).

**Male.** Unknown.

**Female.** FW length 11.5 mm ( $n = 2$ ). **Head:** Frons and vertex dark red-brown. Labial palpus concolorous with head. Antenna concolorous with head. **Thorax:** Dark red-brown. **Forewing:** Dark red-brown in basal 0.15, narrowly bordered by white distally; light purple-gray lateral band, with diffuse, transverse, light tan-orange striae, from costa 0.15–0.35 from base, expanding distally along dorsum; cornucopia-shaped, silver-white patch bordering costa 0.55–0.70 from base; broad, dark red-brown band bordering costal patch basally, 0.40–0.50 from base, attenuate before dorsum; region apical of costal patch orange mixed with red-brown and streaks of white; small, round, dark red-brown spot faintly bordered by white near middle of DC; irregular, wedge-shaped, silver-white patch from near apex to near mid point of termen. Fringe red-brown mixed with purple-gray.

**Hindwing:** White with uniform light gray-brown overscaling. Fringe pale gray to pale yellow with dark red-brown smudge at apex. **Genitalia:** As in Fig. 8 [drawn from JFGC slide no. 6361 (BMNH);  $n = 2$ ]. Apophyses slender, unmodified. Sterigma rectangular, evenly sclerotized; transverse band situated ventro-anteriorly, with shallow U-shaped notch mesally near ostium. Corpus bursae irregular, oblong, with sculptured region ventrally immediately anterad of ostium; dense patches of long spicules; irregular, sclerotized patch near ostium.

**Type material.** Lectotype: female; W. Colombia, San Antonio, 5800' [1850 m], "11.07" [November 1907] (BMNH).

1F, paralectotype, same data as holotype (USNM).

**Diagnosis.** *P. argocosma* is known from two females from western Colombia. It can be distinguished superficially from other species of *Paraptila* by its greater forewing length and darker forewing ground color. The female genitalia lack the inflated apophyses posteriores present in all other species of *Paraptila*, and possess dense patches of large spicules, absent in other members of the genus.

## 2. *Paraptila gamma* (Walsingham), new combination

(Figs. 2, 9)

[Illustrated in Clarke 1958:166 (as *P. infusoria*)]

*Tortrix gamma* Walsingham (1914:287).

*Paraptila infusoria* Meyrick (1926:259), Clarke (1958:167). **NEW SYNONYMY.**

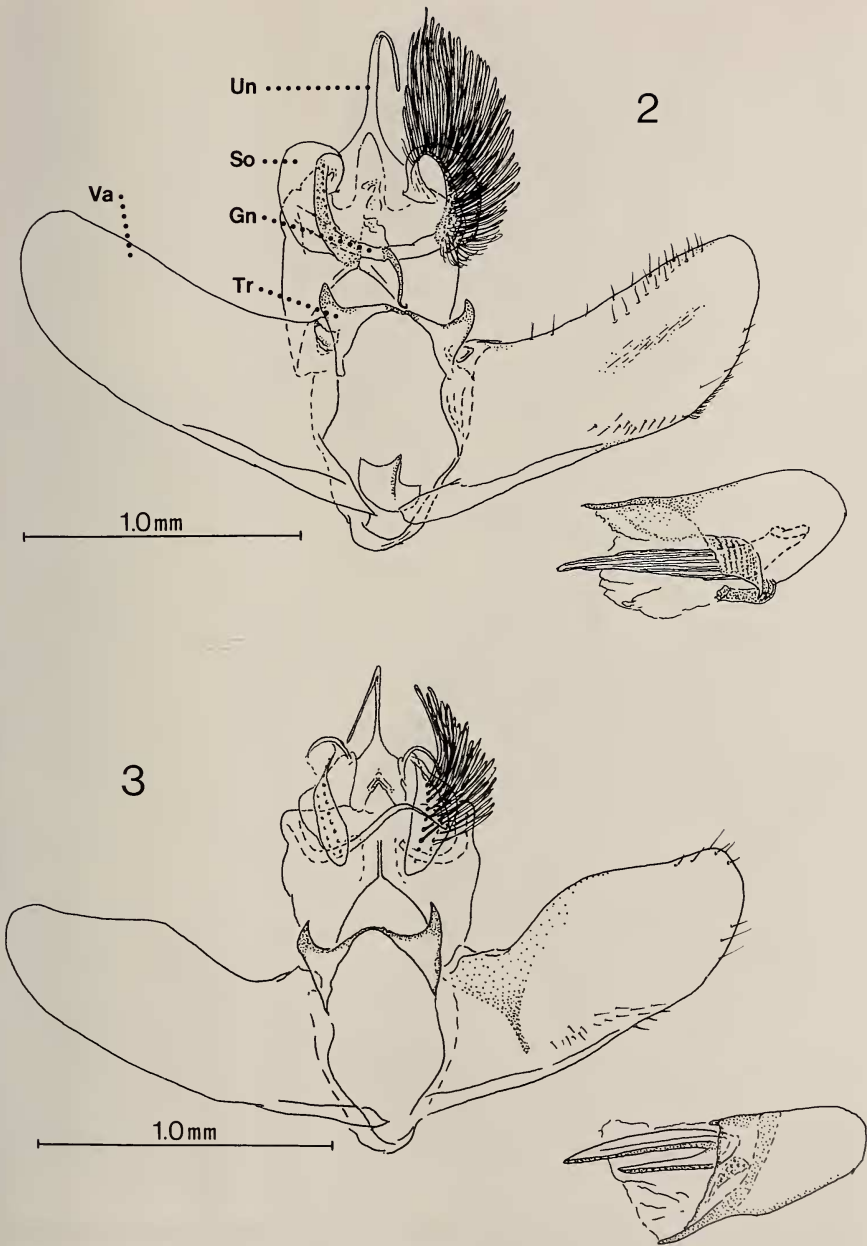
**Male.** FW length 6.5–7.0 mm ( $\bar{x} = 6.7$ ;  $n = 3$ ). **Head:** Frons and vertex light red-brown speckled with whitish yellow. Labial palpus pale yellow, red-brown laterally. Antenna red-brown. **Thorax:** Dark purple-gray with dark red-brown tegulae. **Forewing:** Dark red-brown in basal 0.15; broad, transverse, pale brown band from costa 0.15–0.50 from base, slightly expanded at dorsum; silver-white cornucopia-shaped patch bordering costa 0.60–0.75 from base, bordered distally and basally by darker red-brown; narrow brown band curving from near apex of DC to tornus, with lighter region immediately apicad; apical region brown with scattered red-brown scales. Fringe dark red-brown. **Hindwing:** White with uniform light gray-brown overscaling; dark red-brown smudge at apex. Fringe whitish yellow and gray. **Genitalia:** As in Fig. 2 (drawn from USNM slide no. 68836;  $n = 3$ ). Uncus simple, extremely long, narrow. Socii strongly arched basally; divided longitudinally into narrow mesal strip bearing dense, long, fine setae, and broader lateral strip without setae. Gnathos narrow, arising well below bases of socii; united mesally into narrow, attenuate, ventrally-curving projection, with minute distal hook. Transtilla with a pair of large, stout, weakly hooked processes basally; narrowed mesally; base with shallow cone-like depression. Valva simple, long rectangular, rounded apically; sacculus weak, narrow. Aedeagus broad, stout, with single large cornutus.

**Female.** FW length 10.0 mm ( $n = 1$ ). As described for male. **Genitalia:** As in Fig. 9 (drawn from BMNH slide no. 6370;  $n = 1$ ). Apophyses posteriores greatly inflated; apophyses anteriores weakly broadened. Sterigma lightly sclerotized with strongly sclerotized band-like pouch on left lateral side (looking anteriorly). Corpus bursae with irregular folds and creases posteriorly, densely covered with small spicules.

**Type material:** Holotype: male; Mexico, Tabasco, Teapa, ".III" [March], H. H. Smith (BMNH).

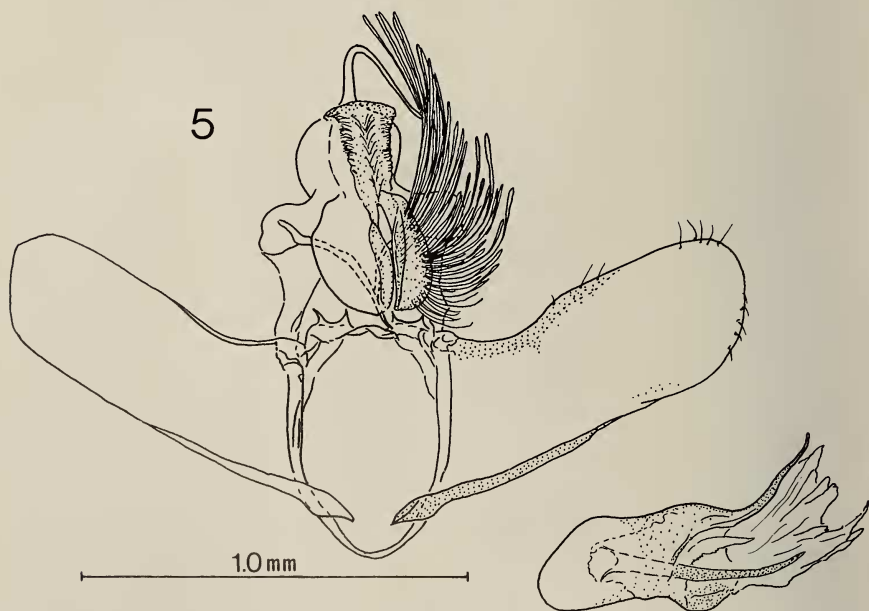
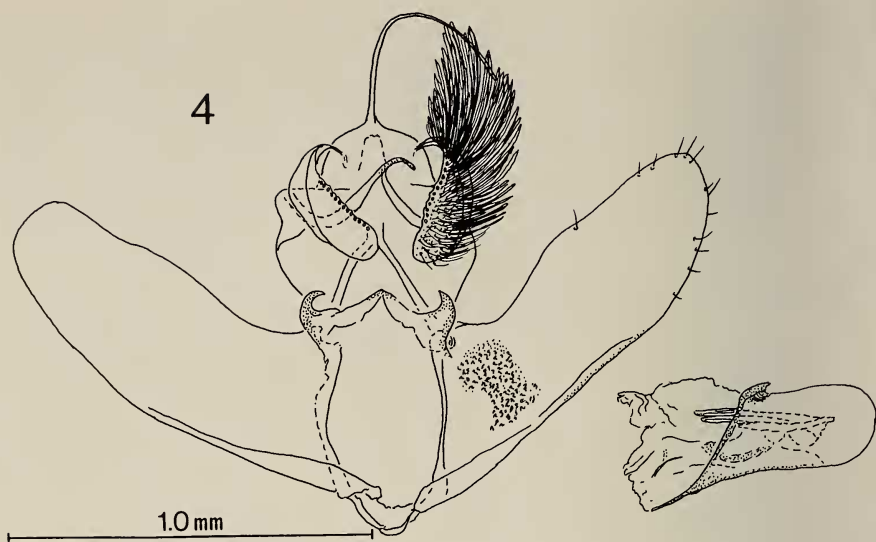
1M (lectotype of *P. infusoria*), Costa Rica, San Jose, ".22" [1922] (H. Schmidt, BMNH); 2F paralectotypes, same data as lectotype (BMNH), 1F paralectotype, same locality as lectotype, ".20" [1920] (BMNH).

**Additional material:** 1M, Costa Rica, Juan Vinas, June [no year], Coll. Wm. Schaus (USNM).

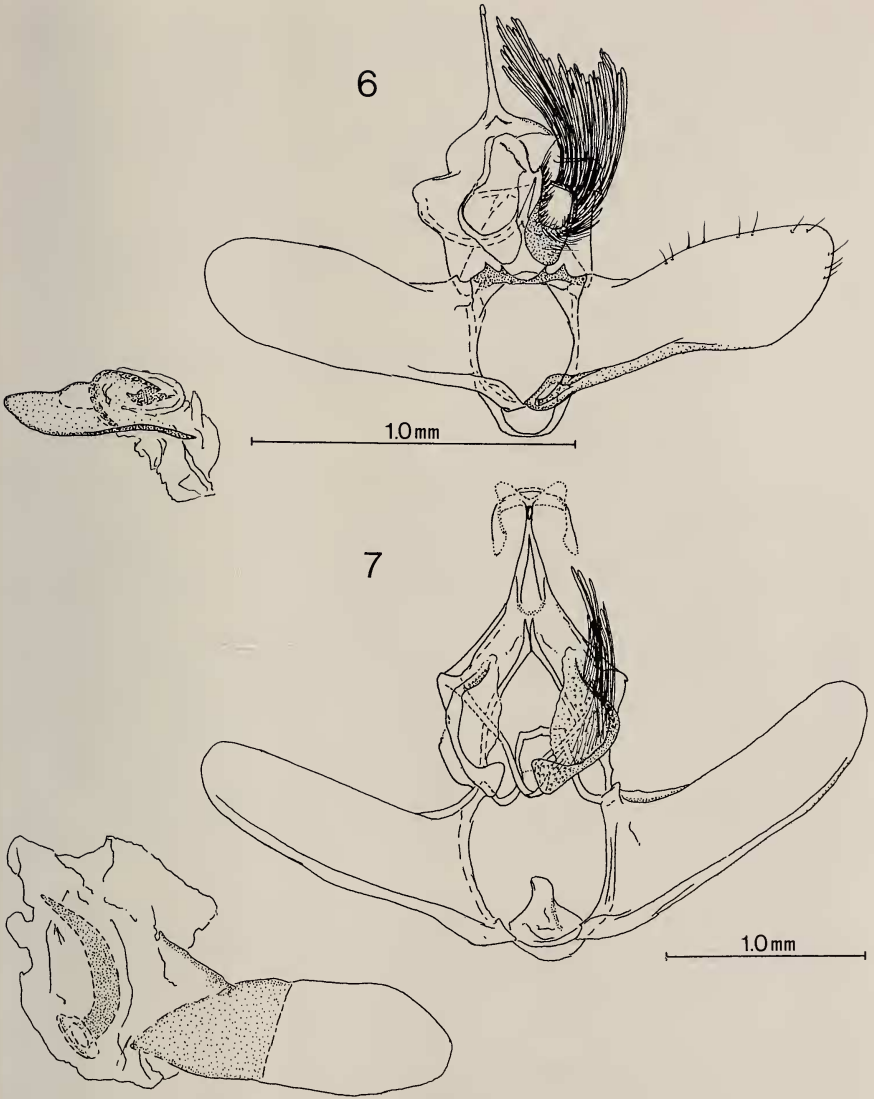


FIGS. 2-3. Male genitalia of *Paraptila* species, valvae spread, aedeagus removed: 2) *P. gamma*; 3) *P. cornucopis*. [Un = uncus; So = socius; Gn = ganthos; Tr = transtilla; Va = valva.]





FIGS. 4-5. Male genitalia of *Paraptila* species, valvae spread, aedeagus removed: 4) *P. pseudogamma*; 5) *P. bloomfieldi*.



FIGS. 6-7. Male genitalia of *Paraptila* species, valvae spread, aedeagus removed: 6) *P. biserrata*; 7) *P. equadora*.

**Diagnosis:** *Paraptila infusoria*, *P. gamma*, and *P. cornucopis* are identical in superficial facies, and it is possible that all represent a single species. The male genitalia of the holotypes of *P. gamma* and *P. infusoria* are indistinguishable, and on this basis the synonymy of the two is proposed. Females from Costa Rica associated with the male

holotype of *P. infusoria* are weakly distinguished from the female holotype of *P. cornucopis* by the nearly smooth, narrow band of the ductus bursae immediately anterior of the ostium. The structure is more wrinkled and pocket-like in *P. cornucopis*, suggesting that this species is distinct from *P. gamma* and *P. infusoria*. The male genitalia of the paratype of *P. gamma* are unlike those of the holotype of *P. gamma* and *P. infusoria* because of the presence in the former of a digitate patch of sclerotization from the costa on the inner third of the face of the valva, and a slender process from the dorsum of the socii. Hence this male is provisionally assigned to *P. cornucopis* (see below).

### 3. *Paraptila cornucopis* (Walsingham), new combination (Figs. 3, 10, 14)

*Enarmonia cornucopis* Walsingham (1914:240).

**Male.** FW length 6.9 mm ( $n = 1$ ). **Head:** Frons and vertex light purple-brown. Labial palpus concolorous with head, slightly darker laterally. Antenna cinerous, chocolate brown at base. **Thorax:** Dark red-brown, with shiny copper tufts posteriorly. **Forewing:** Basal 0.15 dark red-brown; tawny gray band, with faint purplish suffusion and irregular dark striae, from costa 0.15–0.45 from base; cornucopia-shaped, silver-white patch bordering costa 0.60–0.75 from base, with 1–4 minute dark costal dots; broad, red-brown band bordering costal patch basally; red-brown area situated apically and immediately posterior to costal patch; narrow, pale yellow, crescent-shaped line from near apex to mid point of termen. Fringe dark red-brown along termen, gray near tornus. **Hindwing:** Dingy white with uniform light gray-brown overscaling; dark brown smudge at apex. Fringe light gray to brown, dark brown at apex. **Genitalia:** As in Fig. 3 (drawn from USNM slide no. 68835;  $n = 1$ ). Uncus simple, long, slender. Socii large, broad, pendant, with slender digitate dorsal projection from near base. Gnathos narrow, joined distally into slender mesal process with weakly hooked tip. Transtilla constricted mesally; large spur-like process subbasally; shallow cone-like depression at base. Valva long, with narrow, digitate patch of sclerotization in basal 0.25; costa strongly undulate. Aedeagus broad with sclerotized distal process; a large compound cornutus joined basally to a second smaller cornutus.

**Female.** FW length 6.8–9.5 mm ( $\bar{x} = 7.5$ ;  $n = 7$ ). As described for male. **Genitalia:** As in Fig. 10 (drawn from USNM slide no. 68832;  $n = 6$ ). Apophyses posteriores broad, inflated, sack-like. Sterigma weakly sclerotized with irregular, transverse band posterad of ostium; large sclerotized pouch on left lateral side (looking anterad). Ductus bursae reduced. Corpus bursae lightly sclerotized posteriorly, with faint longitudinal creases.

**Type material:** Holotype: female; Mexico, Oaxaca, Salina Cruz, 1906, Wm. Schaus (USNM).

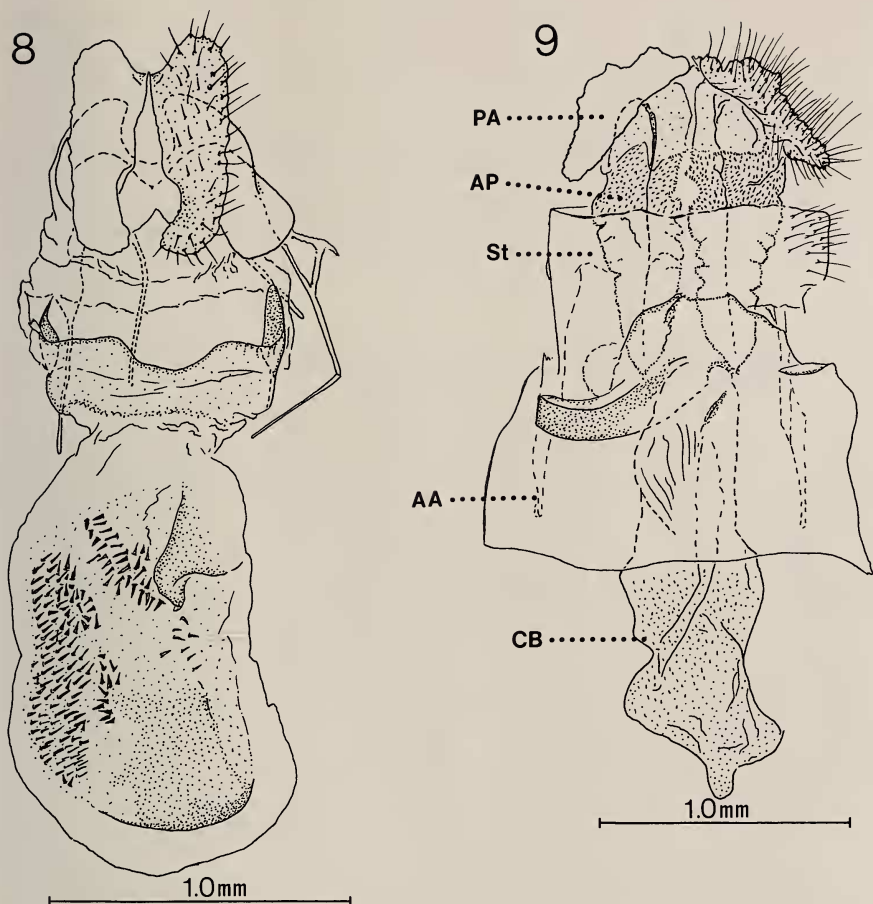
1F paratype, same data as holotype.

1M (paratype of *P. gamma*), Mexico, Veracruz, Jalapa, [no date], M. Trujillo (USNM).

**Additional material:** 6F as follows: MEXICO: Distrito Federal: 2F, Mizantla, July (T. Escalante, USNM). Colima: 2F, Colima, [no date], Condradt Coll. (USNM). San Luis Potosi: 1F, 4 mi S Tamazunchale, 27.vi.1965 (O. Flint, USNM). Veracruz: 1F, Cordoba, 2.vii.1965 (P. Spangler, USNM).

**Diagnosis:** As discussed in the diagnosis of *P. gamma*, *P. cornucopis* is nearly indistinguishable from the former. The two species appear to be allopatric: *Paraptila gamma* is known primarily from Costa Rica with a single record from southern Mexico; *P. cornucopis* occurs throughout much of central Mexico from Veracruz in the east to Colima





FIGS. 8-9. Female genitalia of *Paraptila* species: 8) *P. argocosma*; 9) *P. gamma*. [PA = papillae anales; AP = apophyses posteriores; St = sterigma; AA = apophyses anteriores; CB = corpus bursae.]

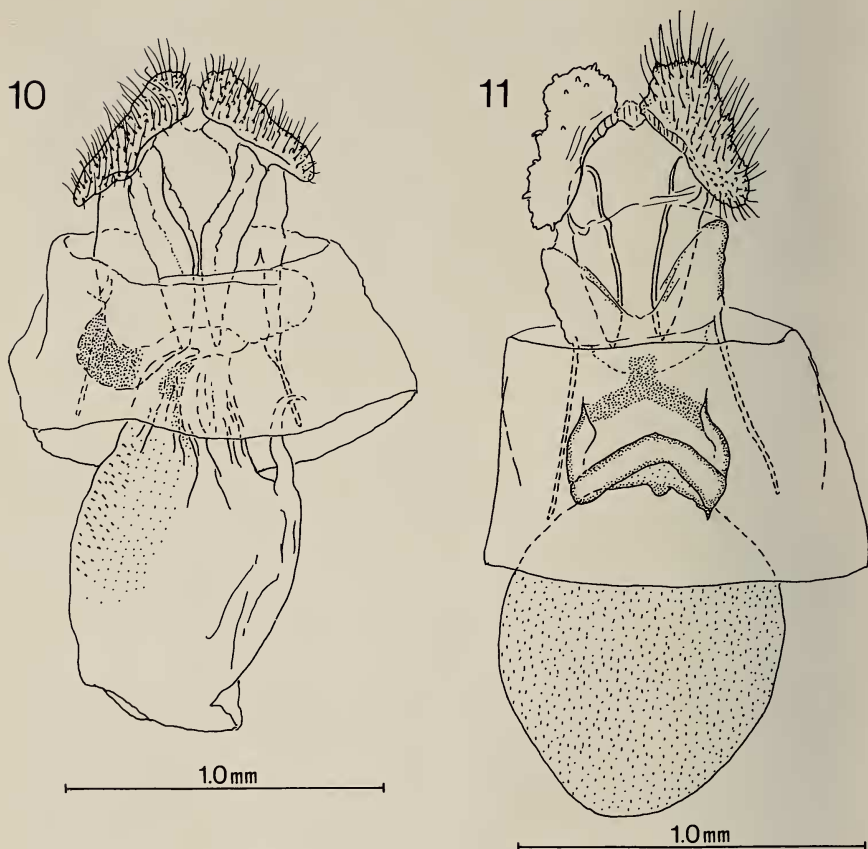
in the west. The association of the single male with the females of *P. cornucopsis* is equivocal; this specimen was treated as a paratype of *Tortrix gamma* (see Diagnosis under *P. gamma*).

This species previously has not been illustrated elsewhere. It is one of several taxa described but not illustrated by Walsingham (1914) in the *Biologia Centrali-Americana*.

#### 4. *Paraptila pseudogamma* Brown, new species

(Figs. 4, 12, 15)

**Male.** FW length 6.0 mm ( $n = 1$ ). **Head:** Frons and vertex light purple-gray. Labial palpus concolorous with head, darker laterally. Antenna dark brown. **Thorax:** Dark brown



FIGS. 10-11. Female genitalia of *Paraptila* species: 10) *P. cornucopsis*; 11) *P. bloomfieldi*.

with shiny posterior copper tufts. **Forewing:** Basal 0.15 dark brown with scattered red-copper scales; basal 0.15-0.40 slate gray with sparse, indistinct, dark brown striae; silver-white cornucopia-shaped patch bordering costa 0.60-0.75 from base; dark brown band bordering costal patch basally, extending to posterior edge of DC; region from costal patch to apex dark brown with scattered orange, copper, and red scales; faint, narrow V-shaped, white line in termen. Fringe red-brown. **Hindwing:** Whitish yellow with uniform light gray-brown overscaling. Fringe gray. **Genitalia:** As in Fig. 4 (drawn from USNM slide no. 68838;  $n = 1$ ). Uncus simple, long, slender. Socii arched at base, long, pendant, with long dense scales. Gnathos narrow, joined distally into slender mesal process. Transtilla with stout, basal, hook-like projection, and shallow depression at bases. Valva long, simple; basal 0.25 with patch of fine scobination; costa slightly depressed in basal 0.25. Aedeagus broad, stout, with sclerotized distal perimeter; a single cornutus with several free apices.

**Female.** FW length 8.5 mm ( $n = 1$ ). As described for male. **Genitalia:** As in Fig. 12 (drawn from USNM slide no. 68837;  $n = 1$ ). Apophyses posteriores inflated. Sterigma weakly sclerotized, with narrow, lateral, slightly arched band above ostium. Corpus bursae weakly sclerotized near ostium; corpus with faint, reticulate pattern of minute spicules.

**Type material:** Holotype: male; El Salvador, Santa Tecia, 28–29.x.1967, E. L. Todd (USNM).

1F paratype as follows: EL SALVADOR: L. Ilopango, nr. Apulo, 4–5.vii.1966 (O. Flint & A. Ortiz, USNM).

**Diagnosis:** *Paraptila pseudogamma* is superficially most similar to *P. gamma* and *P. cornucopis*. The male genitalia of *P. pseudogamma* can be distinguished from those of the latter two species by the broader transtilla with more robust and strongly curved basal hook-like projections, and the scobinate region on the inner face near the base of the valva.

### 5. *Paraptila bloomfieldi* Brown, new species

(Figs. 5, 11, 16)

**Male.** FW length 4.9–5.9 mm ( $\bar{x}$  = 5.4;  $n$  = 3). **Head:** Frons and vertex gray-brown to purple-brown. Labial palpus concolorous with head. Antenna concolorous with head. **Thorax:** Dark brown with orange scale tufts posteriorly. **Forewing:** Basal 0.13 dark brown with scattered red-brown scales; broad, transverse, white to light tan band from costa 0.15–0.40 from base, extending to dorsum; silver-white, cornucopia-shaped patch bordering costa 0.60–0.75 from base; distal 0.60 of wing brown, lighter towards dorsum; red-brown band from near tornus to apex of silver-white patch. Fringe gray-brown. **Hindwing:** Gray-brown. Fringe gray-brown. **Genitalia:** As in Fig. 5 [drawn from JWB slide no. 277 (UCB);  $n$  = 3]. Uncus long, slender. Tegumen broadly expanded subdorsally. Socii large, broadly rounded, with membranous processes extending dorso-caudally from base of socius to base of uncus. Transtilla arched mesally, with short, pointed, paired, teeth-like subbasal processes. Valva simple, subrectangular. Aedeagus stout, blunt, with narrow, pointed, sclerotized distal process; finely dentate ridge dorso-apically; single large cornutus.

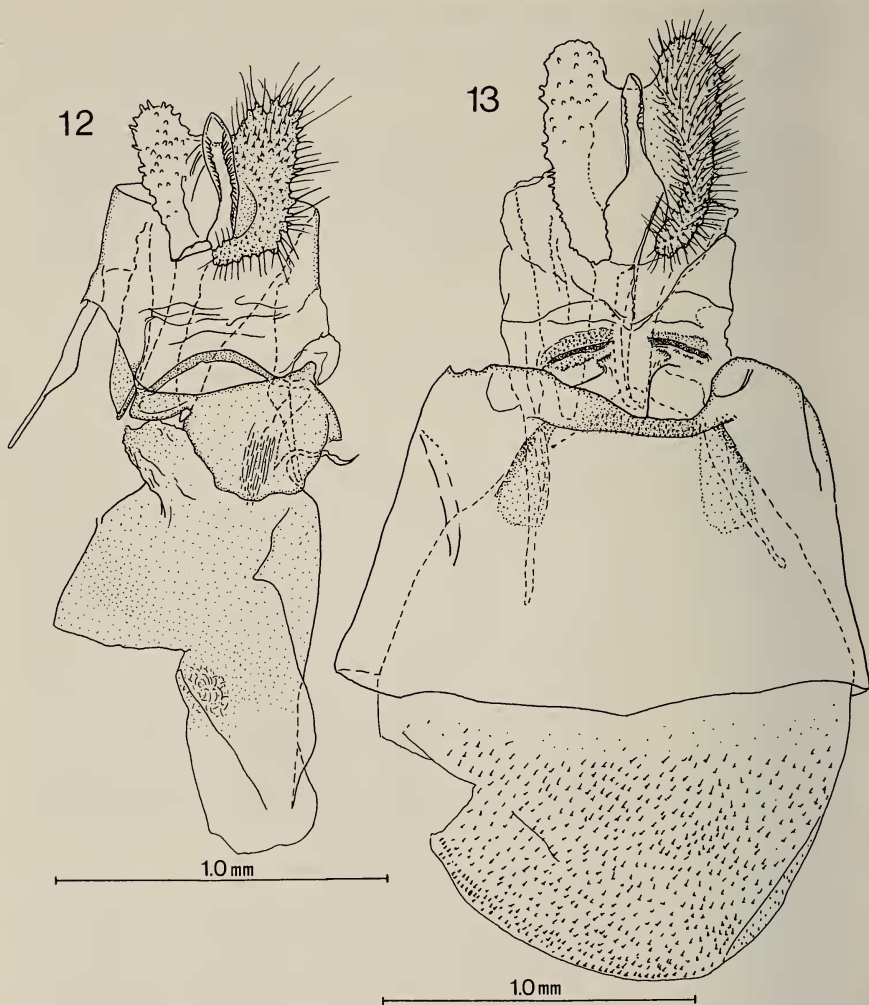
**Female.** FW length 5.5–6.5 mm ( $\bar{x}$  = 6.0;  $n$  = 5). As described for male. **Genitalia:** As in Fig. 11 [drawn from JWB slide no. 266 (UCB);  $n$  = 2]. Apophyses posteriores inflated; apophyses anteriores unmodified. Sterigma unsclerotized except for broad, transverse, U-shaped band with lightly sclerotized caudal arch mesally. Corpus bursae with minute spicules.

**Type material:** Holotype: male; Mexico, Jalisco, Estacion Biologia Chamela, 16–19.x.1987, J. Chemsak and J. Powell (UCB).

4M, 3F paratypes as follows: MEXICO: Colima: 1M, 13 mi N of Manzanillo, microondas Toro, 24–26.xii.1988 (N. Bloomfield, SDNHM). Jalisco: 1M, 1F, same locality as holotype, 21–22.x.1987, blacklight (J. Chemsak & J. Powell, UCB); 1F, 5 km N of El Tuito, 800 m, at light, 23.x.1987 (J. Chemsak & J. Powell, UCB); 1M, 1F, 10.8 mi N of Hwy 54, Nevado Colima [Volcano], 27–30.v.1989 (N. Bloomfield, SDNHM); 1M, 2.3 mi E of Durazno, 3899', 6–8.vi.1989 (N. Bloomfield, SDNHM).

**Additional material:** MEXICO: Guerrero: 1M, 16 km NW of Iguala, 1160 m, 12–15.ix.1982 (J. Chemsak & J. Powell, UCB).

**Diagnosis:** *Paraptila bloomfieldi* can be distinguished from other species in the genus by the broad, well defined, light tan subbasal band of the forewing and the expanded silver-white costal patch. The male genitalia of *P. bloomfieldi* are most similar to *P. biserrata*. Those of *P. bloomfieldi* can be distinguished from those of *P. biserrata* by the unique configuration of the socii, which includes a membranous unscaled portion that extends from the dorsal base of the socius to the base of the uncus. Also, the aedeagus of *P. bloomfieldi* has a long slender



FIGS. 12-13. Female genitalia of *Paraptila* species: 12) *P. pseudogamma*; 13) *P. symmetricana*.

cornutus; cornuti are apparently absent in *P. biserrata*. *Paraptila bloomfieldi* is known from the states of Colima, Guerrero, and Jalisco, along the western coast of central Mexico; *P. biserrata* is known only from Costa Rica.

The single male from Guerrero deviates from the holotype in several respects: it is slightly larger, the forewing ground color is slightly darker, the dentate processes of the transtilla are slightly broader, and the valvae

are shorter and broader basally. Consequently, this specimen is not included in the type series.

### 6. *Paraptila biserrata* Brown, new species

(Figs. 6, 18)

**Male.** FW length 5.0 mm ( $n = 1$ ). **Head:** Frons and vertex dark purple-brown. Labial palpus concolorous with head, lighter mesally. Antenna dark purple-brown. **Thorax:** Dark purple-brown. **Forewing:** Basal 0.15 dark brown with sparse, scattered, red-brown scales; broad, transverse, tan band from costa 0.15–0.45 from base, extending to dorsum; short, transverse, dark brown band from costa 0.45–0.60 from base, terminating near posterior edge of DC; silver-white, hook-shaped patch from costa 0.60–0.70 from base, curving apically to near apex of DC; area between silver-white band and apex mottled with tan and dark brown, faint orange spot at apex of hooked tip of silver-white patch; diffuse, narrow, white transverse bar subapically; narrow brown band extending from near mid point of termen nearly to hooked tip of silver-white band. Fringe brown to tan, lighter near tornus. **Hindwing:** Light gray-brown. Fringe concolorous with wing. **Genitalia:** As in Fig. 6 (drawn from USNM slide no. 69311;  $n = 1$ ). Uncus simple, slender. Tegumen greatly broadened subdorsally. Socii elongate, narrow basally, expanding distally, curving mesally; irregular, wrinkled, semi-sclerotized mesal flap immediately below uncus between bases of socii. Gnathos arms narrow, arising from broadest portion of tegumen, joined distally. Transtilla arched mesally, with short, pointed, paired, subbasal teeth-like processes. Valva elongate, narrow, parallel-sided. Aedeagus stout with slender sclerotized distal process; cornuti absent.

**Female:** Unknown.

**Type material:** Holotype: male; Costa Rica, Turrialba, 22–28.ii.1965, S. S. and W. D. Duckworth (USNM).

**Diagnosis:** *Paraptila biserrata* can be distinguished superficially from other species of *Paraptila* by its broadly C-shaped silver-white costal patch. The genitalia are most similar to those of *P. bloomfieldi*, particularly in the paired, subbasal processes of the transtilla. However, the two can be separated easily by the shape and configuration of the socii and the aedeagus (see Diagnosis of *P. bloomfieldi*). In *P. biserrata* the phallobase is moderately attenuate and cornuti are absent; in *P. bloomfieldi* the phallobase is broadly rounded and there is a single large cornutus.

### 7. *Paraptila symmetricana* Brown, new species

(Figs. 13, 19)

**Male.** Unknown.

**Female.** FW length 9.0 mm ( $n = 1$ ). **Head:** Frons and vertex dark red-brown. Labial palpus concolorous with head. Antenna concolorous with head. **Thorax:** Dark purple-brown. **Forewing:** Basal 0.15 dark brown; basal 0.15–0.40 gray-brown with faint, yellow-brown striae; broad, short, dark red-brown patch from costa 0.40–0.60 from base, extending to near posterior edge of DC; silver-white triangular patch bordering costa 0.60–0.70 from base, with silver-white oval spot below apex of triangular patch; costa with fine, transverse, brown striae between silver-white patch and apex; oblique brown dash from mid point of termen, bordered apically by narrow, silver-white wedge. Fringe light brown to pale yellow, lightest near tornus. **Hindwing:** Gray-brown. Fringe pale yellow. **Genitalia:** As in Fig. 13 (drawn from BMNH slide no. 23540;  $n = 1$ ). Apophyses posteriores inflated. Sterigma unsclerotized with V-shaped depression mesally; irregular, transverse





14



15



16



17



18



19

FIGS. 14-19. Adults of *Paraptila* species: 14) *P. cornucopis*, female; 15) *P. pseudogamma*, holotype male; 16) *P. bloomfieldi*, holotype male; 17) *P. equadora*, holotype male; 18) *P. biserrata*, holotype male; 19) *P. symmetricana*, holotype female.

patch of sclerotization ventro-anterad, divided mesally by ostium. Ductus bursae extremely short, with narrow sclerotized ridges. Corpus bursae with sclerotized band at junction of ductus, curving anterior-laterally.

**Type material:** Holotype: female; Bolivia, Yungas de La Paz, 1908, Seebold, Rebel, "16565" (BMNH).

**Diagnosis:** The silver-white forewing patch of *P. symmetricana* is distinct from that of other species in the genus. It is narrowly divided

into two parts: a small, triangular region along the costa, and a rounded, somewhat teardrop-shaped portion immediately posterior to the costal triangle. The female genitalia of *P. symmetricana* are unique in the possession of dense, fine, slender spicules in the anterior portion of the corpus, and the paired sclerotized ridges of the sterigma.

### 8. *Paraptila equadora* Brown, new species

(Figs. 7, 17)

**Male.** FW length 10.0 mm ( $n = 1$ ). **Head:** Frons and vertex dark gray mixed with red-brown. Labial palpus white-ocherous, gray-brown laterally. Antenna gray, dark red-brown at scape. **Thorax:** Dark gray mixed with red-brown; red-copper tuft posteriorly. **Forewing:** Basal 0.25 with rectangular, red-brown patch, with distal angle directed toward termen; broad, similarly colored triangular patch in middle of wing, with base of triangle bordering costa 0.33–0.75 from base, and vertex attenuate 0.80 from costa to dorsum; latter patch poorly defined apically, bordered by narrow, sinuate, silver-white streak at costa 0.65 from base; diagonal gray band from costa 0.20–0.33 from base, broadening toward dorsum, becoming tan-orange, continuing to mid point of termen. Fringe pale orange. **Hindwing:** Uniform gray-brown. Fringe concolorous with wing. **Genitalia:** As in Fig. 7 (drawn from USNM slide no. 68839;  $n = 1$ ). Uncus slender with broad apical dorsal hood. Socii long, narrow, enlarged apically; longitudinal ridge strongly sclerotized. Gnathos arms angulate, joined distally into slender mesal process. Transtilla narrow basally, with large, rectangular, mesal process. Valva moderately large, rectangular, nearly parallel-sided; sacculus extending to lower edge of apex. Aedeagus large, stout, broadly rounded basally; cornutus large, curved, basally attached.

**Female.** Unknown.

**Type material:** Holotype: male; Ecuador, [Pastaza Province], Shell-Mera, 18.iv.1958, R. W. Hodges (USNM).

**Diagnosis:** *Paraptila equadora* is fairly divergent from other members of the genus and may require separate generic assignment when the female is discovered. It can be distinguished from all other species of *Paraptila* by its greater forewing length, dark brown hindwing, and large hood-like process of the uncus. The aedeagus is also distinctive with an unusually large, curved cornutus.

### ACKNOWLEDGMENTS

I thank the following for allowing me the use of material in their care: J. F. G. Clarke and R. W. Hodges (USNM); D. K. Faulkner (SDNHM); J. A. Powell (UCB); and K. R. Tuck (BMNH). Two anonymous reviewers provided numerous helpful suggestion for the improvement of the manuscript. I thank Norris Bloomfield (SDNHM) and Jerry Powell (UCB) for their collecting efforts in western Mexico. Photographs of adult moths were provided by Victor Krantz (USNM), Kevin Tuck (BMNH), and Don Meyer (Natural History Museum of Los Angeles County). This work was completed with the support of a Smithsonian Postdoctoral Fellowship (1988–1989).

### LITERATURE CITED

- BROWN, J. W. 1990. Taxonomic distribution and phylogenetic significance of the male foreleg hairpencil on the Tortricinae (Lepidoptera: Tortricidae). *Entomol. News* 101: 109–116.
- CLARKE, J. F. G. 1958. Catalogue of the type specimens of Microlepidoptera in the

- British Museum (Natural History) described by Edward Meyrick. Vol. 3. Trustees British Museum, London, England. 600 pp.
- HORAK, M. 1984. Assessment of taxonomically significant structures in Tortricinae (Lep., Tortricidae). Mit. Schweiz. Entomol. Ges. 57:3-64.
- MEYRICK, E. 1912. Descriptions of South American Micro-Lepidoptera. Trans. Entomol. Soc. London 1911:673-718.
- 1926. Exotic Microlepidoptera 3(8-9):225-288, Marlborough.
- POWELL, J. A. 1964. Biological and taxonomic studies on tortricine moths, with reference to the species in California. Univ. Calif. Pub. Entomol. 32:1-317.
- 1986. Synopsis of the classification of the Neotropical Tortricinae, with descriptions of new genera and species (Lepidoptera: Tortricidae). Pan-Pacif. Entomol. 62: 372-398.
- RAZOWSKI, J. 1986. Descriptions of new Neotropical genera of Archipini and rectification of the *Deltinea* problem (Lepidoptera: Tortricidae). Bull. Soc. Sci. Nat. 52: 21-25.
- WALSINGHAM, LORD T. DE GREY. 1914. Lepidoptera-Heterocera. Vol. 4. Tineina, Pterophorina, Orueodina, Pyralidina and Hepialidina (part). In Godman, F. du C. & O. Salvin (eds.), Biologia Centrali-Americana. Insecta. London. 482 pp.

*Received for publication 12 June 1989; revised and accepted 18 August 1990.*